**Claims after this response:**

1(Currently Amended). An imaging system for generating an image of a planar segment of an object, said imaging system comprising:

an x-ray source that generates x-rays at first and second source points, said x-rays from said first and second source points passing through said object;

a planar detector comprising a plurality of photodetectors covered by a layer of scintillation material that converts x-rays into visible light, said planar detector being positioned to receive x-rays from said first and second source points after said x-rays have passed through said object; and

a controller that selects which of said source points generates said x-rays at any given time and that reads a first image formed by x-rays from said first source point and stored in a first portion of said photodetectors while a second portion of said photodetectors measures x-rays from said second source point to generate a second image that is stored in said second portion of said photodetectors.

2(Original). The imaging system of Claim 1 wherein said controller combines said first and second images to form an image of a portion of said object.

3(Original). The imaging system of Claim 1 wherein said x-ray source further comprises a collimator for preventing x-rays generated at said second source point from reaching said first portion of said photodetectors.

4(Currently Amended). The imaging system of Claim 1 wherein said x-ray source comprises:

an electron gun for generating a collimated beam of electrons;

a ~~cathode layer~~ target that generates x-rays when bombarded by electrons from said electron gun; and



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a deflection system for positioning said beam of electrons so as to strike said ~~cathode layer~~ target at selected points thereon,

wherein said first and second source points correspond to first and second locations on said ~~cathode layer~~ target.

5(Original). The imaging system of Claim 1 wherein said controller resets a third portion of said photodetectors while said second image is being stored in said second portion of said photodetectors.



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